

General

Guideline Title

Cobalamin (vitamin B₁₂) deficiency—investigation and management.

Bibliographic Source(s)

Medical Services Commission. Cobalamin (vitamin B₁₂) deficiency - investigation and management. Victoria (BC): British Columbia Medical Services Commission; 2012 Jan 1. 5 p. [16 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Diagnosis

Who to Test

- Presentation: Unexplained neurologic symptoms, such as paresthesias, numbness, poor motor coordination, memory lapses or cognitive and personality changes. Anemia with features as described below.
- Laboratory findings: macrocytic anemia or macrocytosis with oval macrocytes or hypersegmented neutrophils or pancytopenia.

Consider Testing

- Demographics: elderly, i.e., >75 years
- Medical history: inflammatory bowel disease (of small intestine)
- Surgical history: gastric or small intestine resection
- Dietary history: prolonged vegan diet, i.e., no meat, poultry or dairy products
- Medication history: long-term use of histamine (H₂) receptor antagonists or proton pump inhibitors (at least 12 months), or metformin (at least 4 months)

Routine screening for cobalamin deficiency is not indicated.

How to Test

Perform a complete blood count (CBC), blood film and serum cobalamin in all patients suspected of cobalamin deficiency. Interpret serum cobalamin levels in light of clinical symptoms, because the test has the following limitations:

- It measures total, not metabolically active cobalamin.
- The levels of cobalamin do not correlate well with clinical symptoms. Elderly patients may have normal cobalamin levels with clinically significant cobalamin deficiency, while women taking oral contraceptives may have decreased blood cobalamin levels due to a decrease in transcobalamin, a carrier protein, but no clinical symptoms of deficiency.
- There is a large 'grey zone' between the normal and abnormal levels.
- The reference intervals may vary between laboratories. The conventional cut-off for serum cobalamin deficiency varies from 150 to 220 pmol/L. Using a more common cut-off of 220 pmol/L, the following interpretation is recommended:

Serum Cobalamin (pmol/L)	Probability of Symptomatic Deficiency
<75	High
75-150	Moderate
150-220	Low
>220	Rare

Management

Treatment

Early treatment of cobalamin deficiency is particularly important because neurologic symptoms may be irreversible.

- Oral crystalline cyanocobalamin (commonly available form) is the treatment of choice. Dosing for pernicious anemia or food-bound cobalamin malabsorption is 1000 mcg/day. In most other cases a dose of 250 mcg/day may be used.
- Oral administration of cobalamin is as effective as parenteral (see Figure 1 in the original guideline document).
- Advantages of oral supplementation are comfort, ease of administration, and cost.
- Prophylactic cobalamin supplementation is recommended for strict vegans and patients with food bound cobalamin malabsorption, and for pernicious anemia.
- Usefulness of prophylactic administration of cobalamin in elderly is unknown.

Parenteral administration should be reserved for those with significant neurological symptoms. It includes 1-5 intramuscular or subcutaneous injections of 1000 mcg crystalline cyanocobalamin daily, followed by oral doses of 1000-2000 mcg/day. Retest serum cobalamin levels after 4-6 months to ensure they are in the normal range.

Supplements

- Toxicity is minimal (especially with doses usually used in supplementation).
- Oral supplements are available over the counter in various doses and dosage forms; prices will vary.
- PharmaCare coverage: Some PharmaCare plans* provide coverage for parenteral formulations (100 mcg/mL and 1000 mcg/mL)

*Coverage is subject to drug price limits set by PharmaCare and to the patient's PharmaCare plan rules and deductibles. See www.health.gov.bc.ca/pharmacare/ and <http://www.health.gov.bc.ca/pharmacare/benefitslookup/>. Note: Please review product monographs and current Health Canada advisories, warnings and recalls at: www.hc-sc.gc.ca for the most up to date information.

Ongoing Care

Duration of Therapy

Patients with pernicious anemia require lifelong therapy, while patients with food-malabsorption require treatment until underlying condition or diet is corrected (see Appendix A in original guideline document for dietary sources of cobalamin).

Monitoring

Annual testing of blood cobalamin levels is recommended in patients with non-nutritional cobalamin deficiency.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Cobalamin (vitamin B₁₂) deficiency

Guideline Category

Diagnosis

Management

Risk Assessment

Treatment

Clinical Specialty

Family Practice

Hematology

Internal Medicine

Nutrition

Intended Users

Advanced Practice Nurses

Clinical Laboratory Personnel

Dietitians

Nurses

Physicians

Guideline Objective(s)

To provide guidance on investigation and management of cobalamin (vitamin B₁₂) deficiency in adults (≥ 19 years)

Target Population

Adults ≥ 19 years of age with suspected or confirmed cobalamin deficiency

Interventions and Practices Considered

Diagnosis

1. Assessment of signs and symptoms

2. Dietary, medical, surgical, and medication histories (risk assessment)
3. Laboratory tests: complete blood count (CBC), blood film, serum cobalamin

Treatment/Prevention

1. Oral cyanocobalamin
2. Parenteral cobalamin in patients with significant neurological symptoms
3. Frequency of treatment and retesting serum cobalamin levels during parenteral administration

Major Outcomes Considered

- Incidence of specific risk factors in association with cobalamin deficiency
- Sensitivity and specificity of diagnostic tests
- Effectiveness of treatment options
- Toxicity, cost, and coverage of supplementation

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Evidence was obtained through a systematic review of peer-reviewed literature (up to December 2011) using the databases MEDLINE, PubMed, EBSCO, Ovid, and the Cochrane Collaboration's Database for Systematic Reviews. Clinical practice guidelines from other jurisdictions for cobalamin or vitamin B₁₂ testing, deficiency, malabsorption, and anemia were also reviewed (up to December 2011).

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Not stated

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

This is an evidence based clinical guideline for general practitioners with consensus statements when evidence is not available. It is based on scientific evidence current as of the Effective Date.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guideline was approved by the British Columbia Medical Association and adopted by the Medical Services Commission.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

This is an evidence based clinical guideline for general practitioners with consensus statements when evidence is not available. The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate diagnosis and treatment of cobalamin (vitamin B₁₂) deficiency

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

The Clinical Practice Guidelines (the "Guidelines") have been developed by the Guidelines and Protocols Advisory Committee on behalf of the Medical Services Commission (MSC). The Guidelines are intended to give an understanding of a clinical problem and outline one or more preferred approaches to the investigation and management of the problem. The Guidelines are not intended as a substitute for the advice or professional judgment of a health care professional, nor are they intended to be the only approach to the management of clinical problems. The MSC cannot respond to patients or patient advocates requesting advice on issues related to medical conditions. If you need medical advice, please contact a health care professional.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Medical Services Commission. Cobalamin (vitamin B12) deficiency - investigation and management. Victoria (BC): British Columbia Medical Services Commission; 2012 Jan 1. 5 p. [16 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jan 1

Guideline Developer(s)

Medical Services Commission, British Columbia - State/Local Government Agency [Non-U.S.]

Source(s) of Funding

Medical Services Commission, British Columbia

Guideline Committee

Guidelines and Protocols Advisory Committee

Composition of Group That Authored the Guideline

Not stated

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [British Columbia Ministry of Health Web site](#) .

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on January 31, 2013. The information was verified by the guideline developer on February 12, 2013.

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